9(amended), 10(amended), 11, 12(amended), 13, 14(amended), 15(amended), 16(amended), 17, 18(amended) and 19(amended).

The claims stand under rejection and objection for various reasons.

Claims 1-19 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.
Claims 1 and 12 (and their dependent claims) are indefinite for cross linked polymer and thermoplastic matrix.
Claims 2 (and its dependent claims) and 11 are indefinite for impact modifier.

Claim 6 is indefinite for cross linker.

Claims 6, 8, 9, 10, 16, 17, 18 and 19 are multiple dependent claims and are indefinite.

In response the Applicant has amended the claims to further define cross linked polymer, thermoplastic matrix, impact modifier and cross linker and to remove any multiple dependent claims.

Claims 1-19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over USP 5,242,968 (MINGHETTI), USP 5,304,592 (GHAHARY) and USP 5,130,374 (COZENS).

The Examiner alleges that MINGHETTI, note in the entirety: GHAHARY, note column 1, lines 24-43, column 2, lines 20-50, column 3, lines 30-59 and column 4, lines 1-65: and COZENS, note column 2, lines 32-45, column 3, lines 63-68 and column 4, lines 1-65, teach and disclose acrylic

thermoformable acrylic sheet, granite textured plastics and rigid thermoplastic compositions, composites produced by process for forming the same extruded sheets and thermoformed product which make the invention obvious.

According to the Examiner the prior art teaches and discloses various cross linked polymers and thermoplastic matrixes within Applicant's claimed ranges which render the claimed invention obvious.

The Applicant has reviewed the cited art. The references, individually or jointly, do not teach, suggest or disclose the present invention.

MINGHETTI teaches a method of making granite sheet by cell casting process. The method of the present invention is quite different from the method of MINGHETTI.

The present invention is directed to a method of preparing a re-processable thermoplastic granite resin. The method of MINGHETTI teaches how to control particle swelling and particle/matrix interpenetrating during the curing process, and a method of making granite sheet through curing the polymer/monomer syrup. MINGHETTI discloses that the addition of 5 to 20% PMMA polymer (substantially uncross-linked) is critical for controlling the particle settling and for forming the interpenetrated particle/matrix network. The particulates disclosed by MINGHETTI are composed of 70%-90% by weight crosslinked PMMA and 10% to 30% un-crosslinked PMMA would form interpenetrated network with matrix PMMA after curing, see lines 60 column 6 to lines 14 of column 7.

Because of this interpenetrated network, the granite sheet made by MINGHETTI cannot be reprocessed, just like the thermoset material cannot be reprocessed or recycled.

The present invention teaches a method of making the granite resin through CFSTR, emulsion process, cell casting, and extrusion compounding. There is no need to be concerned about the swelling of particulates by monomer during the sample preparation and the method does not produce a material which has an interpenetrated network between particulates and matrix. The particulates disclosed in the present invention are flexible enough to pass through extruder and tough enough to maintain the particle integrity after multiple passes of extruder for molding and sheet extrusion applications.

GHAHARY teaches the combination of thermoplastic and thermoset for particulate is critical to suspend the particles in liquid thermoplastics. The present invention uses thermoset particles to create granite articles and the thermoset particles can sustain the severe shearing of multiple passes through extrusion and molding. The particles with thermoplastic and thermoset combination taught by GHAHARY could not sustain the shearing of multiple passes through extrusion and compounding.

COZENS discloses rigid PVC polymer or copolymer articles that have a matt surface. This reference does not teach, suggest or disclose the presently claimed invention

which is directed to a composition comprised of poly(alkyl(meth)acrylate.

In view of the above, the Applicant believes that the claims herein should now be allowable to the Applicant. Accordingly, reconsideration and allowance are requested.

Respectfully submitted;

Date: 6/19/01

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Attachment:

Marked Version of Proposed Amended Claims

Applicant: Yang, S.
Serial No.: 09/445,844
Filed: 12/15/99
For: Plastic Compositions Having Mineral Like Appearance

Marked Version of Proposed Amended Claims

1. (amended) A composite plastics composition comprising a particulate crosslinked polymer dispersed within a thermoplastic matrix, wherein:

(a) the composite plastics composition comprises 10 to 45 weight percent of the crosslinked polymer, based on the weight of the composite plastics composition, and the crosslinked polymer has a particle size substantially from 0.2 to 1.2 millimeters;

(b) the crosslinked polymer comprises 0.1 to 15 weight percent inert filler and 0.1 to 20 weight percent crosslinker, based on the total weight of crosslinked polymer; and

(c) the crosslinked polymer is visually differentiable from the thermoplastic matrix,

wherein the thermoplastic matrix comprises 50 to 100 weight percent poly(alkyl (meth)acrylate) and zero to 50 weight percent impact modifier, based on the weight of thermoplastic matrix and

wherein the impact modifier is a multi-stage sequentially-produced polymer comprising at least three stages in a sequence of a non-elastomeric first stage, an elastomeric second stage and a non-elastomeric third stage.

~~[2. A composite plastics composition according to claim 1 wherein the thermoplastic matrix comprises 50 to 100 weight percent poly(alkyl (meth)acrylate) and zero to 50 weight percent impact modifier, based on the weight of thermoplastic matrix.]~~

3. (amended) A composite plastics composition according to claim [~~2~~] 1 wherein the poly(alkyl (meth)acrylate) comprises a copolymer of 80 to 99 weight percent methyl methacrylate monomer units and 1 to 20 weight percent (C_1-C_{10})alkyl acrylate monomer units, based on total weight of the poly(alkyl (meth)acrylate).

~~[4. A composite plastics composition according to claim 2 or 3 wherein the impact modifier is a multi-stage sequentially produced polymer comprising at least three stages in a sequence of a non-elastomeric first stage, an elastomeric second stage and a non-elastomeric third stage.]~~

5. (amended) A composite plastics composition according to claim [4] 1 wherein the multi-stage polymer is an emulsion polymer comprising monomer units of methyl methacrylate in the first stage, monomer units selected from one or more of butadiene, styrene and (C_1-C_8)alkyl acrylates in the second stage, and monomer units selected from one or more of (C_1-C_4)alkyl methacrylates, styrene and acrylonitrile in the third stage.

6. (amended) A composite plastics composition according to [~~any one of the preceding claims~~] Claim 1 wherein the crosslinked polymer comprises 90 to 99.5 weight percent monomer units selected from one or more of vinylaromatic monomer and (meth)acrylic monomer and 0.5 to 10 weight percent crosslinker, based on the weight of crosslinked polymer, wherein the crosslinker is selected from one or more of allyl methacrylate, ethylene glycol dimethacrylate and divinylbenzene.

[~~8. A composite plastics composition according to any one of the preceding claims wherein the crosslinker is selected from one or more of allyl methacrylate, ethylene glycol dimethacrylate and divinylbenzene.~~]

9. (amended) A composite plastics composition according to [~~any one of the preceding claims~~] Claim 1 wherein the inert filler is selected from one or more of titanium dioxide, iron oxide, alumina, pigments, carbon black and silica.

10. (amended) A composite plastics composition according to [~~any one of the preceding claims~~] Claim 1 wherein the particle size of the crosslinked polymer is substantially from 0.3 to 1.2 millimeters.

12. (amended) A process for preparing a composite plastics composition comprising:

(a) preparing a crosslinked polymer comprising 0.1 to 15 weight percent inert filler and 0.1 to 20 weight percent crosslinker, based on the weight of crosslinked polymer;

(b) comminuting the crosslinked polymer to particles having a particle size substantially from 0.2 to 1.2 millimeters;

(c) dispersing 10 to 45 weight percent of the particles of crosslinked polymer within 55 to 90 weight percent of a thermoplastic matrix by a heat processing treatment; and

(d) recovering the composite plastics composition as a particulate material,

wherein the thermoplastic matrix comprises 50 to 100 weight percent poly(alkyl (meth)acrylate) and zero to 50 weight percent impact modifier, based on the weight of thermoplastic matrix and

wherein the impact modifier is a multi-stage sequentially-produced polymer comprising at least three stages in a sequence of a non-elastomeric first stage, an elastomeric second stage and a non-elastomeric third stage.

14. (amended) A process according to claim 12 [~~or 13~~] wherein the heat processing treatment of step (c) is selected from one or more of extrusion blending, hot-melt kneading and hot-melt batch mixing.

15. (amended) A composite plastics composition prepared by the process claimed in Claim [~~any one of claims~~] 12 [~~to 14~~].

16. (amended) A process for preparing a simulated mineral article comprising forming, with heat treatment of a composite plastics composition as claimed in [~~any one of claims~~] Claim 1 [~~to 11~~] into a sheet, laminated sheet or molded material.

18. (amended) An extruded sheet material resulting from extrusion of a composite plastics composition as claimed in [~~any one of claims~~] Claim 1 [~~to 11~~].

19. (amended) A thermoformed product of a composite plastics composition as claimed in [~~any one of claims~~] Claim 1 [~~to 11~~]